

SOBOLEWSKI, H.

A study on the traffic safety of trains with two locomotives on curves. p.201  
(PRZEGLAD KOLEJOWY, Vol. 9, No. 6, June 1957, Warsaw, Poland)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 9, Sept. 1957, Unclassified.

PHASE I BOOK EXPLOITATION

POL/5033

Czapliński, Stefan, Master in Engineering, Jan Dyduszyński, Professor, Master in Engineering, Jan Sobolewski, Docent, Master in Engineering, Zbigniew Szaniawski, Master in Engineering, and Zdzisław Ziolkowski, Professor, Master in Engineering.

Najnowsze rozwiązania konstrukcyjne w budowie aparatury chemicznej 1959/1960; praca zbiorowa (Latest Design Developments in the Construction of Chemical Apparatus 1959/60; a Collective Work) Warsaw, Państwowe Wydawn. Techniczne, 1960. 127 p. Errata slip inserted. 1,690 copies printed. (Series: Nowa technika, zesz. 32)

Coordinator: Jan Dyduszyński, Professor, Master in Engineering; Scientific Ed. PWT: Irena Gajewska, Master in Science; Tech. Ed.: I. Milewska.

PURPOSE: This book is intended for chemists, engineers, and designers of chemical equipment for research and industry. It may also be used by students in higher technical schools.

Card 1/5

Latest Design (Cont.)

POL/5033

COVERAGE: The book discusses the latest (up to 1959) trends in the development of some designs for chemical equipment. The authors deal specifically with progress in the design of absorption and distillation equipment, and latest developments in the design of gas compressors and sedimentation separators used in the chemical industry. No personalities are mentioned. References accompany each section.

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Card 2/5

NOWARA, Wieslaw, mgr inż.; KAGANOWSKI, Antoni, mgr inż.; SOBOLEWSKI, Józef, inż.

Critical evaluation of certain methods of laboratory cement testing. Inz i bud 21 no.11:400-401 N '64.

1. Rzeszow School of Engineering, Bialystok.

CZERNIC-LICHMAN, Hanna; SOBOLEWSKI, Jozef

On the role of some endogenous factors in the etiopathogenesis  
of periodontosis in the light of recent studies. Pol. tyg. lek.  
19 no.7:269-270 10 F '64.

1. Z Zakladu Stomatologii Zachowawczej Akademii Medycznej w  
Lodzi (kierownik: prof. dr Mieczyslaw Fuchs).

SOBOLEWSKI, L. (Engr.):

Zarys Chłodniczych Urządzeń Absorpcyjnych. (Sketch of Absorbing Agents in Refrigeration). In  
Vol. V, Współczesne Problemy Inżynierii Chemicznej (Common Problems of Chemical Engineering)  
Pages 551-558, Warsaw, 1950.

MACHEJ, Karel; TURCZEWSKI, Janwik

Studies on the heat penetrating coefficient in a sprinkled tube while condensing vapor from the saturated air. Chemia stosow 3 i no.4:443-466 '64.

1. Institute of Chemical Engineering and Apparatus Design, of the Polish Academy of Sciences, Gliwice. Submitted September 21, 1964.

SOBOLEWSKI, M.

SOBOLEWSKI, M. Vibrators, modern equipment for driving piles into the ground. p. 418. GOSPODARKA WODNA. Warszawa, Poland. Vol. 15, No. 10, Oct. 1955

SOURCE: East European Accessions List (EEAL) LC Vol. 5, No. 6, June 1956

COUNTRY : Poland H-32  
CATEGORY : Chemical Technology - Artificial and  
Synthetic Fibers  
ABS. JOUR. : RZKhim., No. 24 1959, No. 88616  
  
AUTHOR : Sobolewski, M.  
INST. :  
TITLE : Development of the Industry of Chemical  
Fibers  
  
ORIG. PUB. : Chemik, 1959, 12, No 4, 137-139  
  
ABSTRACT : A review of the technical and economic  
development of the industry of chemical fibers in various  
countries and in the Polish People's Republic.  
T. Budkevich  
  
CARD:

SOBOLEWSKI, M.

"Some problems of the rubber industry." p. 221. (Chemik. Vol. 6, no. 7/8,  
July/Aug. 1953. Katowice.)

SO: Monthly List of East European Acquisitions, Vol. 3, No. 2, Library of Congress,  
Feb. 1954, Uncl.

SOBOLEWSKI, Marian, mgr inz.

The Polish synthetic fiber industry in the prospective plan up to 1980. Chemik 15 no.5:156-160 My '62.

1. Zjednoczenie Przemyslu Wloken Sztucznych, Lodz.

S/081/62/000/024/045/052  
B106/B186

AUTHORS: Kraul, Emil, Cłapinski, Jan, Sopiela, Wacław, Sobolewski,  
Marian, Rybicki, Zbigniew

TITLE: Methods for producing a fiber from polyvinyl alcohol

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24 (II), 1962, 953,  
abstract 24P1034 (Pol. patent 44511, June 10, 1961)

TEXT: A method is described for the production of a fiber from polyvinyl alcohol by coagulation from aqueous solutions in a bath, dehydration and simultaneous stretching of the deposited fiber, removal of part of the salt contained in the fiber by washing, drying of the fiber, thermal treatment and acetalation. The method distinguishing features of this are as follows: the spinning solution flows from the spinneret into the coagulating bath at a velocity of 12 - 13 m/min. It then follows its course at an angle of 90°. The fiber leaves the coagulating bath at 15 m/min; there is a distance of 130 - 150 cm between the exit of the spinning solution from the spinneret and the point at which the fiber changes its direction in the bath. The excess from this bath is removed

Card 1/2

S/081/62/000/024/045/052

Methods for producing a fiber from ...

B106/B186

and the fiber is passed through a washing bath which consists of an aqueous solution of sodium sulfate (concentration 140 - 155 g/l). The pH value of the spinning solution and coagulating bath is adjusted to 7 as to yield a spinning solution of polyvinyl alcohol containing <0.2% by weight of ashes. The maximum moisture of the dried fiber is 3% and the maximum drying temperature is 120°C. Before it is dried the fiber ought to contain 35-37% by weight of polyvinyl alcohol, 58 - 60% by weight of water, and 5-7% by weight of salt. The temperature of the washing bath is

25 - 29°C, the washing time of the fiber is ~1 min. [Abstracter's note:  
Complete translation.]

Card 2/2

SOBOLEWSKI, Marian

Fifty years of the Polish chemical fiber industry. Przegl wlokiens 16  
no.6:348-350 Je '62.

SOBOLEWSKI, Marian, mgr inż.

The photochemical industry in Poland and in the world.  
Chemik 16 no.12: Supplement no.3: [41-] D'63

SOBOLEWSKI, S.

"Organization of mechanized openwork end planks by using single-shovel excavators working above the ground level." p. 320. (MATERIALY BUDOWLANE Vol. 9, No. 12, Dec. 1954. Warszawa, Poland)

SO: Monthly List of East European Accessions. (EEAL). LG. Vol. 4, No. 4. April 1955. Unclassified.

SOBOLEWSKI, T.

*Matt*  
Chemical analysis of gypsum rock according to American and German standards. T. Sobolewski and P. Wajda. Cement-Wafse-Gip, 13(22), 52-7 (1957).—The ASTM C28-52 method and the German DIN 1163 method of analysis gave for  $\text{CO}_2$ ,  $\text{MgO}$ , and  $\text{NaCl}$  identical results, and for  $\text{Fe}_2\text{O}_3$  +  $\text{Al}_2\text{O}_3$  0.18% and 0.31%, resp. By the ASTM method  $\text{H}_2\text{O}$  of crystall. was 20.43, hygroscopic  $\text{H}_2\text{O}$  0.04,  $\text{CaO}$  32.43,  $\text{SO}_3$  45.81,  $\text{SiO}_2$  + matter insol. in dil.  $\text{HCl}$  0.85%; by the DIN method the resp. results were 20.60, 0.09, 32.11, 45.98, and 0.73%. F. I. Hendel

POLAND / Chemical Technology. Chemical Products and  
Their Application--Ceramics. Glass. Binding  
Materials. Concrete H-13

Abs Jour: Ref Zhur-Khimiya, No 3, 1959, 9108

Author : Sobolewski, T.

Inst : Not given

Title : Chemical Analysis of Gypseous Stone by German  
and American Standards

Orig Pub: Cement. Wapno. Gips, 1958, 14, No 4, 79-82

Abstract: A comparison of methods of chemical analysis of  
gypseous stones by ASTM C 26-52 and DIN-1168  
standards was conducted on two samples of known  
chemical composition. Close conformity of results

Card 1/2

149

SOBOLEWSKI, Tadeusz (Wroclaw)

"A general map of Germany 1 : 200 000." Reviewed by Tadeusz  
Sobolewski. Czasop. geograf. 33 no.2:270-271 '62.

SOBOLEWSKI, Tadeusz

"Germany and Europe. The Great Shell Atlas." Reviewed by Tadeusz Sobolewski. Czasop geograf 34 no.1:92 '63.

SOBOLEWSKI, W.

The development of the synthetic fibers industry. p. 157.

CHEMIK. (Ministerstwo Przemyslu Chemicznego i Stowarzyszenie Naukowe-Techniczne  
Inżynierow i Technikow Przemyslu Chemicznego) Warszawa. Poland. Vol. 12, no. 4,  
April 1959.

Monthly List of East European Accessions (EEAI) LC. Vol. 8, no. 8, August 1959.

Uncl.

SOBOLIC, F.

"A few notes on the tectonics of the Pezinok-Pernek crystalline rocks".

GEOLOGICKE PRACE; ZPRAVY, (Slovenska akademia vied, Geologicky ustav  
Dionyza Stura) Bratislave, Czechoslovakia, No. 15, 1959.

Monthly List of East European Accessions (EEAI), LC, Vol 8, No. 8, August 1959.

BYDMAN, I.Ye.; ROMANOVA, V.G.; SOBOL'KIN, S.Ya.

Evaluating the salinity of underground waters on the basis of  
hydrogeological well logging. Razved.i prom.geofiz.no.17:79-83 '57.  
(MIRA 10:12)

(Borings) (Water, Underground)

SOBOLOTSKAYA Y.B.

Rubber Abst.  
May 1954  
Synthetic Rubbers and Like Products

6  
(4)  
2079. Kinetics and mechanism of the copolymerisation of vinyl chloride and vinylidene chloride.  
A. D. AUKIN, S. S. MEDVEDEV, P. M. KHOLOKOVSKII, and V. B. SOBOLOTSKAYA. *J. Phys. Chem. U.S.S.R.*, 1953, 27, 1616-24; *Plaste-u Kaut.*, 1954, 1, 45. The benzoyl peroxide catalysed, suspension polymerisation of this system has been investigated, at 50°, 60°, and 70° C. Conclusions are drawn on the reactivity of each monomer.

3S2H21M1123-193

II-11-51

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001651910010-7

"The Shape and Width of Spectral Lines Emitted by a Flame and by a Direct Current Arc." By International Colloquium on Spectroscopy, 14-15 May 1956.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001651910010-7"

SOBOLOV, V. S.

Technology

Building and maintenance of hackling machines in the hemp and jute industry, Moskva,  
Gizlegprom, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952/1953, Uncl.

SOROLOVA, V. Technicka spoluprace A. Kudrnova

Effect of thermal factors on working performance and on the course of the recovery phase. Cesk. fysiol. 8 no.3:245-246 Apr 59.

1. Katedra lekarskych ved ITVS, fakulta telesne vychovy, Praha. Predneseno na III. fysiologickych dnech v Brne dne 14. 1. 1959.

(HEAT, eff.

on working performance (Cz))

(WORK, physiol.

eff. of heat on performance (Cz))

SOBOLOVA, V.;SKORPIL, V.

Participation of the striate muscles in restoration processes in  
animals adapted to low environmental temperature. Cesk. fysiolog.  
9 no.1:51-52 Ja 60.

1. ITVS-Fakulta telesne vychovy, Fysiologicky ustav CSAV, Praha.  
(ACCLIMATIZATION)  
(MUSCLES physiol.)

SOBOLOVA, V.

Effect of thermoregulation and of motor adaptation on the work performance and on the recovery phase. Cesk.fysiol. 9 no.3: 265--66 My '60.

1. Katedra lek. ved ITVS, fak. KU Praha.  
(ADAPTATION PHYSIOLOGICAL)  
(BODY TEMPERATURE)  
(MOVEMENT)  
(EXERTION)

SOBOLSKI, Konstanty, dr

Engineers and technicians, facilitate the way of living for  
disabled veterans! Przegl techn 84 no.1:6 6 Ja '63.

SOBOLSKI, R., prof., mgr., inz.; HAWRYLAK, H., Zastepca prof., dr., inz.;  
STRYCZEK, S., adiunkt, mgr., inz.; TESIOROVSKIY, J., adiunkt, mgr.,  
inz.

Investigation of the dynamic coefficient of crane steel supporting  
structures. Mechanika Wrocław 6 no.43:65-108 '61.

1. Katedra Maszyn Dzwigowych i Urzadzen Transportowych Politechniki  
Wroclawskiej.

SOBOLSKI, Roman, prof.; HAWRYLAK, Henryk, dr., inz.

Analysis of the needs and possibilities of domestic machinery  
production, essential for open cut mining of brown coal.  
Przegl mech 21 no.7:193-197 Ap '62.

1. Politechnika Wroclawska.

WROBLEWSKI, Teodor, prof.; SOBOLSKI, Roman, prof.

On the fate of the chair of machine designing in technical  
colleges. Przegl mech 21 no.12:357-359. 25 Je '62.

1. Politechnika, Wroclaw.

SOBOLSKI, Roman, prof. inz.; HAWRYLAK, Henryk, dr inz.

On some dynamic phenomena in the operation of a multibucket  
dredger excavators on wheels. Przegl mech 21 no.18:549-552  
25 S '62.

1. Politechnika, Wroclaw.

SOBOLSKI, Roman, prof.

Hydraulic power systems, their application and development prospects.  
Przegl mechan 21 no.23:713-714 10 D '62.

1. Rzecznik Stowarzyszenia Inżynierów Mechaników Polskich,  
przewodniczący Oddziału Stowarzyszenia Inżynierów Mechaników  
Polskich, Wrocław.

SOBOISKI, Roman, prof.

Scientific and Technological Conference on the Construction,  
Utilization and Testing of Pumps. Przegl mech 22 no.14:425-  
426 25 Jl '63.

1. Przewodniczacy Oddzialu Stowarzyszenia Inzynierow Mechanikow  
Polskich, Wrocław, oraz kierownik Katedry Maszyn Dzwigowych i  
Urzadzen Transportowych, Politechnika, Wrocław.

SOBOLSKI, Roman, prof. agr. inz., HAWRYLAK, Henryk, dr., inz.

Breakdown correlation of machine sets in opencast mining.

Przegl mech 22 no.19:585-591 10 0 '63.

1. Kierownik Katedry i Zakladu Maszyn Dzwigowych i Urzadzen Transportowych, Politechnika, Wroclaw (for Sobolski).
2. Wykładowca, Katedra Maszyn Dzwigowych i Urzadzen Transportowych, Politechnika, Wroclaw (for Hawrylak).

SOBON, Janina

Cooperation of the Upper Silesian Field Station of the  
Geological Institute with institutions abroad. Przegl geol  
11 no.5:239-240 My '63.

SOBON, J.

Schedule of sessions of the Upper Silesian Field Station of  
the Geological Institute. Przegl geol 11 no.5:249-250 My '63.

SOBON, J.

Special library of the Upper Silesian Field Station. Przegl  
geol 11 no.5:250 My '63.

BACA, Ferenc, inz.arch. (Backa Topola, Dure Salaja 1); SOBONJA, Petar,  
tehn. (Backa Topola).

Industrial method of building at the Prvi Maj Building  
Enterprise, Backa Topola. Tehnika Jug 18 no.10:Supplement:  
Gradevinarstvo 17 no.10:1842-1844c 0'63.

ACCESSION NR: AP4040426

S/0302/64/0007002/0025/0028

AUTHOR: Sobornikov, Yu. P.; Kravets, P. N.; Yanik, A. F.

TITLE: Capacitance parametrons with pulse-type junction diodes

SOURCE: Avtomatika i priborostroyeniye, no. 2, 1964, 25-28

TOPIC TAGS: semiconductor diode, parametron, capacitance parametron, junction diode, junction diode parametron, digital computer

ABSTRACT: The details of a new design of C-parametron using quick-pulse-response Ge junction diodes are reported. The diodes have a base resistivity of 3-5 ohms and a barrier capacitance of 6-28 pf at -1 v bias; they are used in the simplest self-biased series-supplied circuit which permits a substantial diode-parameter spread. Clock frequencies of 200 and 300 kc are selected for 3-cycle and 2-cycle h-f pumping systems, respectively; the parametrons are intended for industrial computers. A 3-input parametron may have 6 logical couplings (with

Card 1/2

ACCESSION NR: AP4040426

R = 20 kohms); a 5-input parametron, 10 logical couplings. Other details are given. Orig. art. has: 2 figures, 2 formulas, and 1 table.

ASSOCIATION: Institut avtomatiki gosudarstvennogo komiteta po priborostroyeniyu (Institute of Automation, State Committee for Instruments)

SUBMITTED: 00 DATE ACQ: 24Jun64 ENCL: 00

SUB CODE: DP, EC NO REF SOV: 002 OTHER: 001

Card 2/2

ACCESSION NR: AP4042955

S/0102/64/000/004/0037/0048

AUTHOR: Doly\*ns'ka, N. O. (Dolinskaya, N. A.) (Kiev); Maralin, V. G. (Kiev); Sobornikov, Yu. P. (Kiev); Yany\*k, A. F. (Yanik, A. F.) (Kiev)

TITLE: High-frequency pumping systems in parametron digital computers

SOURCE: Avtomaty\*ka, no. 4, 1964, 37-48

TOPIC TAGS: digital computer, parametron, parametron digital computer, industrial digital computer

ABSTRACT: A 3-cycle pumping system is considered which permits synthesizing industrial digital computers with parametrons operating at an excitation frequency 4--30 Mc, with 20--30 oscillations per packet (clock frequencies, 100--500 kc). Hard-closed self-synchronizing and ring 3-phase relaxation-oscillator schemes for 3-cycle semiconductor submodulators are described, as well as mixed and purely semiconductor h-f supply schemes which have a pulse-amplitude pumping

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ACCESSION NR: AP4042955

modulation in the power-amplifier output stage. Schemes of (a) directional switching of C-parameters by pulse-biasing the operating point and (b) transistor switching of the pumping voltage are discussed. Orig. art. has: 8 figures, 8 formulas, and 2 tables.

ASSOCIATION: none

SUBMITTED: 12Feb63

ENCL: 00

SUB CODE: DP

NO REF SOV: 003

OTHER: 002

Card 2/2

L 22140-65 EPF(n)-2/EWT(d)/EWP(1) Pg-4/Pk-4/P1-4/Po-4/Pq-4/Pu-4/Pae-2 SSD/ASDA-5  
AEDC(a)/AFMDC/AFETR/AFTC(p)/RAEMA/RAEMD/ESDD(p) IJP(c) WW/RH/BC  
ACCESSION NR: AP5001746 S/0302/64/000/004/0056/0059

AUTHOR: Dolinskaya, N. A.; Repnin, V. N.; Sobornikov, Yu. P.

TITLE: Device for comparing parameters with several set points

SOURCE: Avtomatika i priborostroyeniye, no. 4, 1964, 56-59

TOPIC TAGS: automatic control, automatic control design, automatic control system, automatic control theory

ABSTRACT: In digital systems of automatic industrial-process control, the current value of a process parameter is automatically compared with one or more set points. As existing synchronous comparison devices are too complicated, a new asynchronous device has been developed in which the code of each set point coincides, in the storage unit, with its numerical value. An additional indicant is introduced to identify the next-in-line set point of the same parameter. A functional diagram of the new device is briefly described. A 256-point laboratory

Card 1/2

L 22140-65

ACCESSION NR: AP5001746

hookup is reported to have been tested. Orig. art. has: 1 figure.

ASSOCIATION: Institut avtomatiki Goskomiteta po priborostroyeniyu Gosplana  
SSSR (Institute of Automation, State Committee on Measuring Instruments,  
Gospian SSSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: IE

NO REF SOV: 000

OTHER: 000

Card 2/2

L 56526-65

ACCESSION NR: AP5009401

S/0208/65/005/002/0366/0369

681.142.2

16

B

AUTHOR: Sobornikov, Yu. P. (Kiev)

TITLE: On a method of division and determination of multiplicative overflow for computers operating in a system of residue classes

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 5, no. 2, 1965, 366-369

TOPIC TAGS: computer theory, computer programming

ABSTRACT: In connection with the unsolvability in the general case of the congruence  $yz \equiv x \pmod{m_i}$ , an indirect machine method for the division of integers in a system of residue classes is developed. It is based on the decomposition of exact  $(z)$  or of rounded  $(z')$  into residue representations of degree  $2^i$  ( $i = 0, 1, \dots, k$ ;  $2^k \leq z$ ). The method is free of the limitation of digital division in residue number systems, possible only for integral quotients. Given a non-redundant system of residue classes having the numerical range

$$M = \prod_{i=1}^k m_i$$

Card 1/2

L 56526-65

ACCESSION NR: AP5009401

where  $n$  is the number of relatively prime modules and where positive integers are in the interval  $0-(M/2 - 1)$  and negative  $M/2-(M-1)$ . The method is illustrated in an example of division of positive numbers by a machine with an adder and a circuit for multiplication in a system of residue classes along with a converter, which converts, for example, from the residue code into a code with a mixed base. A tabular illustration of division is given for  $m_1 = 7, 5, 3, 2; M = 210$  and  $x = 104, y = 10$ . Orig. art. has: 11 formulas, 1 table.

ASSOCIATION: none

SUBMITTED: 16Nov64

ENCL: 00

SUB CODE: DP, MA

NO REF SOV: 000

OTHER: 002

*bat*

Card 2/2

SOBORNICKOV, Yu.P. (Kiyev)

Method of division and determination of multiplicative overflow  
for electronic computers operating in residue number systems.  
Zhur. vych. mat. i mat. fiz. 5 no.2:366-369 Mr-Ap '65.  
(MIRA 18:5)

L 00976-66 EMT(d)/EMT(l)/EMT(h) IJF(c)

UR/0102/65/000/002/0045/0053

ACCESSION NR: AP5014215

AUTHOR: Sobornikov, Yu. P. (Kiev)

TITLE: Three-valued parametron logic in Post's algebra 16, 5

SOURCE: Avtomatyka, no. 2, 1965, 45-53

TOPIC TAGS: ternary logic circuit, computer logic, logic element, ternary parametron, computer component

ABSTRACT: Ternary notation offers many advantages over binary and other systems of coding information; discrete automata based on three-valued logical elements offer much greater speed than analogous automata with binary elements. The possibility of using autoparametric resonance of the third type in a nonlinear oscillating circuit to construct logical elements with three stable phase states is discussed. It is demonstrated that the design of any three-valued operator of the basic logical system can be achieved with a single ternary parametron if use is made of the simplest lines of complex inter-parametron linking. The construction of a ternary parametric logic in Post's algebra is based on the principle of the linear vector addition of input information signals and the parametron's capacity for phase discrimination. [14]  
Orig. art. has: 5 figures, 3 tables, and 9 formulas.

Card 1/2

L 00976-66

ACCESSION NR: AP5014215

ASSOCIATION: none

SUBMITTED: 10Jul64

NO REF SOV: 003

ENCL: 00

OTHER: 002

SUB CODE: DP, EC

ATTD PRESS: 4069

Card 2/2

L 35956-66 EWT(d) IJP(c)

AGC NR: AP6027353

SOURCE CODE: UR/0102/66/000/002/0017/0025

33

AUTHOR: Sobornikov, Yu. P. (Kiev)

B

ORG: none

TITLE: Arithmetic operations with integers of arbitrary sign in a system of residual classes and their circuit realization

SOURCE: Avtomatyka, no. 2, 1966, 17-25

TOPIC TAGS: arithmetic, integer, computer circuit

ABSTRACT: Arithmetic operations with integers of arbitrary sign in a non-redundant residual class counting system (NRRCCS) are considered; this includes the operations of microprogrammed division, determination of additive and multiplicative redundancy for the case where the overall range of the NRRCCS is partitioned into equal subranges representing positive and negative numbers. The author proposes the structure of an arithmetic device (AD) consisting of addition-subtraction and multiplication circuits in NRRCCS, a "conveyer" circuit for conversion to a combined-base code (CBC) and a comparison circuit in CBC. The AD performs the operations of addition, subtraction, multiplication, microprogrammed division, raising to the n-th power, determination of additive and multiplicative redundancy, and universal group operation -- all pertaining to integers of arbitrary sign in NRRCCS; and also conversion to CBC, scaling with respect to one or more NRRCCS moduli or to a constant that is relatively

Card 1/2

ACC NR: AP6024362

SOURCE CODE: UR/0280/66/000/002/0049/0058

AUTHOR: Sobornikov, Yu. P. (Kiev)

ORG: none

TITLE: Synthesis of combinational networks realizing arithmetic operations in a system of residual classes.

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1966, 49-58

TOPIC TAGS: Boolean algebra, computer circuit, circuit design, circuit theory, matrix element

ABSTRACT: The concept of the output function of adding, subtracting and multiplying networks is introduced. The properties of the diagonal symmetry and repetitiveness of the equivalent elements of the square m-matrices of these networks are defined and the method of their equivalent transformation to a finite set of Boolean matrices is described. It is shown that the synthesis of logic networks realizing modulo-m arithmetic operations can be reduced to the synthesis of a finite set of Boolean combinational networks with a single output terminal and multiple input terminals. The combinational network itself consists of logic elements realizing

Card 1/2

SOBORNKOVA, I.G.

Effect of irrigation on Ciscaucasian terrace Chernozems of Rostov  
Province [with summary in English]. Pochvovedenie no.2:65-74 F '59.  
(MIRA 12:3)

1. Rostovskiy-na-Donu gosudarstvennyy universitet.  
(Rostov Province--Irrigation)  
(Chernozem soils)

L 29277-66 -EWP(j)/EWT(m)/T RM  
 ACC NR: AP6019321

SOURCE CODE: UR/0079/65/035/008/1460/1463

AUTHOR: Gololobov, Yu. G.; Dmitriyeva, T. F.; Zinov'yev, Yu. M.; Soborovskiy, L. A.

ORG: none

TITLE: Vinyl esters of phosphorus acids. IV. Vinyl chlorophosphates

SOURCE: Zhurnal obshchey khimii, v. 35, no. 8, 1965, 1460-1463

TOPIC TAGS: phosphate ester, acetaldehyde, organic synthetic process

ABSTRACT: In the reaction of  $\text{POCl}_3$  with acetaldehyde at  $80-100^\circ$  in an autoclave at about 2 atm in the presence of triethylamine, vinyl dichlorophosphate (I) or divinyl chlorophosphate (II) formed depending on the molar ratio of the initial substances:  $\text{MeCHO} + \text{POCl}_3 + \text{Et}_3\text{N} \rightarrow \text{CH}_2=\text{CHOP(O)Cl}_2$  (I);  $2\text{MeCHO} + \text{POCl}_3 + 2\text{Et}_3\text{N} \rightarrow (\text{CH}_2=\text{CHO})_2\text{P(O)Cl}$  (II). (I) had been prepared for the first time. By the reaction of (I) with dimethylamine, vinyl dimethylamidochlorophosphate (III) was prepared. (I) could be used as a starting material for the synthesis of phosphates with two different  $\alpha$ -alkenyl ester groups - e.g., the reaction of (I) with butyraldehyde in the presence of  $\text{Et}_3\text{N}$  yielded vinyl - butenyl-1 chlorophosphate (IV). By treating (IV) with acetylacetone in the presence of  $\text{Et}_3\text{N}$ , the compound

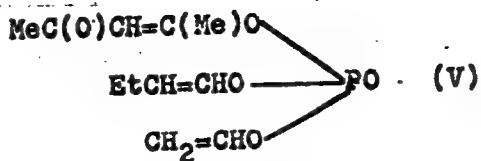
UDC: 546.185, 547.361.21

Card 1/2

32  
31  
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L 29277-66

ACC NR: AP6019321



was obtained, which is the first phosphoric acid ester with three different alpha-alkenyl groups that has ever been prepared. The reaction of  $\text{POCl}_3$  with acetone proceeded with greater difficulty than that with acetaldehyde; isopropenyl dichlorophosphate  $\text{CH}_2=\text{CO(Me)-POCl}_2$  (VI) formed with a small yield. The new compounds that have been synthesized had the following boiling points: I,  $36-40^\circ/30$  mm; III,  $60-66^\circ/1.0$  mm; IV,  $57-61^\circ/2.0$  mm; V,  $96-102^\circ/10^{-3}$  mm; VI,  $69-70^\circ/30$  mm. Orig. art. has: 3 formulas and 1 table. [JPRS]

SUB CODE: 07 / SUBM DATE: 16Jul64 / ORIG REF: 003

Card 2/2 (C)

SOBOROVSKY, L. Z.  
ca

EXTRACTS AND PROPERTIES INDEX

Oxidation of hydrohalic salts of phenylhydrazine in the presence of copper salts. A. B. Bruker and L. Z. Soborovskiy. *J. Gen. Chem. (U. S. S. R.)* 5, 1024 (1945). Gitterman and Heile (Ber. 25, 1074 (1892)) obtained good yields of PhCl, PhI<sub>2</sub> and PhI by the oxidation of the resp. hydrohalic salts of PhNH<sub>2</sub>H<sub>2</sub> (I) with 1 mols. of CuSO<sub>4</sub>. Treating CuCl<sub>2</sub> in 12% HCl in the cold, with stirring, with an equimol. amt. of I resulted in a complete decolorization of the soln. and ppn. of white, cryst. LiHCl·CuCl (II). The reaction is conceived as a partial oxidation of I with the formation of CuCl which reacts with I, giving II. This theory is supported by a nearly 100% yield of II obtained by the interaction of CuCl and I. The slight variations in the compn. of II obtained are caused by its instability to atm. O<sub>2</sub>. Thus, II in HCl on exposure to air or addn. of CuCl, is rapidly decompl. with the formation of PhCl, but can be preserved for months by keeping it in hermetically sealed containers. The probable mechanism of the oxidation of I in HCl to PhCl with an excess of Cu<sup>2+</sup> salt consists of preliminary formation of II which on further oxidation forms PhN<sub>2</sub>Cl and this with CuCl gives PhCl according to the Sandmeyer reaction.

Chas. Blaue

ARMADA METALLURGICAL LITERATURE CLASSIFICATION

SOBOROVSKII, L. S.

"Chemistry and Technology of Poisonous Military-Substances," Par. 15, B-81482  
and Par. six, B-84216. (193?)

B-84689, 21 Apr 55

SOBOROVSKY, L. Z.

CA

**Formation of a phosphorus-carbon bond in the combined reaction of hydrocarbons, phosphorus trichloride, and oxygen** L. Z. Soborovskiy, Yu. M. Zinov'ev, and M. A. Iuglin. *Poklady Akad. Nauk S.S.R.* 67, 281 (1949).—In the complete absence of O<sub>2</sub>, PCl<sub>3</sub> does not react (with formation of a C-P bond) with paraffins, cycloparaffins, olefins, or their derivs., below 350-400°, and the process is unaffected by irradiation (Hg lamp). Similarly the hydrocarbons do not react with POCl<sub>3</sub>, either in the presence or the absence of O<sub>2</sub>. However, simultaneous

action of PCl<sub>3</sub> and O<sub>2</sub> on the hydrocarbons yields RPOCl<sub>2</sub> and POCl<sub>3</sub> (as well as HCl) with paraffins, while olefins undergo addn., yielding chloroalkane-phosphonyl dichlorides and POCl<sub>3</sub>. The reaction is formulated as  $2\text{PCl}_3 + \text{RH} + \text{O}_2 \rightarrow \text{RPOCl}_2 + \text{POCl}_3 + \text{HCl}$ , and resp.  $\text{RCH}=\text{CH}_2 + 2\text{PCl}_3 + \text{O}_2 \rightarrow \text{RC}_2\text{H}_5\text{POCl}_2 + \text{POCl}_3$ . Since the paraffins are essentially unattacked by O<sub>2</sub> under mild conditions, the reaction is probably initiated by PCl<sub>3</sub> oxidation, causing a simultaneous reaction with the hydrocarbon, probably by radical reaction. PCl<sub>3</sub> and the liquid hydrocarbons were treated with O<sub>2</sub> (21 hr.) passed through a porous plate disperser, with a consequent temp. rise to 40-70°; gaseous hydrocarbons were passed simultaneously with O<sub>2</sub> into PCl<sub>3</sub>. Distn. of the mixts. gave 55-60% yields of reaction products (olefin or paraffin types) calc'd. on the reacted hydrocarbon; only C<sub>2</sub>H<sub>6</sub> gave a very poor yield. The following were isolated (b.p., d<sub>4</sub><sup>20</sup>, and % given, resp.): C<sub>2</sub>H<sub>5</sub>POCl<sub>2</sub> (from isobutane), b<sub>4</sub> 55.7°, 1.1200, 1.660; C<sub>2</sub>H<sub>5</sub>POCl<sub>3</sub> (from isobutane), b<sub>4</sub> 67.9°, 1.1280, 1.3001; C<sub>2</sub>H<sub>5</sub>POCl<sub>2</sub> (from 1-methylbutane), b<sub>4</sub> 61.5°, 1.1220, 1.1208; C<sub>2</sub>H<sub>5</sub>POCl<sub>3</sub> (from 1-methylbutane), b<sub>4</sub> 82.1°; C<sub>2</sub>H<sub>5</sub>POCl<sub>2</sub> (from 2,3-dimethylbutane), b<sub>4</sub> 75.0°, 1.1733, 1.4715; C<sub>2</sub>H<sub>5</sub>POCl<sub>2</sub> (from cyclohexane), b<sub>4</sub> 34.1°, m. 30.40°, —; C<sub>2</sub>H<sub>5</sub>POCl<sub>3</sub> (from heptane), b<sub>4</sub> 30.8°, 1.1852, 1.4830; C<sub>2</sub>H<sub>5</sub>POCl<sub>2</sub> (from 2,2,4-trimethylpentane), b<sub>4</sub> 81.2°, 1.1329, 1.4507; C(CH<sub>3</sub>)<sub>2</sub>POCl<sub>2</sub> (from C<sub>2</sub>H<sub>6</sub>), b<sub>4</sub> 86.5°, 7.0°, 1.5416, 1.4998; C<sub>2</sub>H<sub>5</sub>ClPOCl<sub>2</sub> (from butene), b<sub>4</sub> 86.7°, 1.4015, 1.4030; C<sub>2</sub>H<sub>5</sub>ClPOCl<sub>3</sub> (from isobutylene), product could not be freed from isobutylene polymers, b<sub>4</sub> 78-80°, —. Similarly, CICH<sub>2</sub>CH<sub>2</sub>Cl and CHCl<sub>3</sub> give low yields of the corresponding P derivs. Neither MeCN nor MeNC reacts and both of them hinder oxidation of PCl<sub>3</sub> to POCl<sub>3</sub>, but they do not prevent the normal reaction of the reactive hydrocarbons listed above. C<sub>2</sub>H<sub>2</sub> does not react. The work is believed to be independent of that reported by Clayton and Jensen (U.S. 43, 1315d). Styrene and octane derivs. are hardly contaminated by polymers (no data). G. M. Kosulapoff

Translation W-16087, 3 Jan 51

CA ZOGROVSKY, L.Z.

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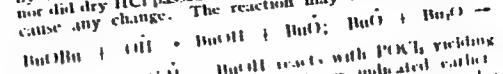
Preparation of phospho-organic compounds by a reaction of phosphorus trichloride and oxygen with hydrocarbons and their halogen derivatives and with ethers. L. Z. Solotrovskii, Yu. M. Amos'ev, and M. A. Inglim. *Potklyad. Akad. Nauk SSSR* 73, 333 (1950); cf. *C. A.* 44, 1001.

Aliphatic chlorides react with  $\text{PCl}_3$  and  $\text{O}$  analogously to the hydrocarbons and yield the corresponding phosphoryl dichlorides, isolated as mixts. of the possible isomers; careful fractionation of the products from  $\text{BuCl}$  yielded all 4 possible isomers, whose distribution, expressed as moles/mole of total phosphoryl dichloride, is shown in parentheses:  $\text{CICH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2$ , (0.16),  $\text{b}.$  110-13°,  $d_4^{25}$  1.3532,  $n_D^{20}$  1.4950;  $\text{CICH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2\text{Me}$ , (0.94),  $b.$  95°,  $d_4^{25}$  1.4028,  $n_D^{20}$  1.4963;  $\text{CICH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2\text{Et}$ , (0.29),  $b.$  81°,  $d_4^{25}$  1.357,  $d_4^{20}$  1.4018,  $n_D^{20}$  1.4940;  $\text{CICH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2\text{Pr}$ , (0.05),  $b.$  78.0°,  $d_4^{25}$  1.3751,  $n_D^{20}$  1.4880. The hydrocarbons also yield isomer mixts., and the mobility of the replaced H atoms is deducible from the yields of the corresponding isomeric phosphoryl dichlorides; in studies with hydrocarbons, it was shown that the P-C link is most readily formed at the tertiary C atom, followed by secondary C, and least readily at the primary C atom. The following isomer distributions were found:  $\text{C}_4\text{H}_8$  gave 0.731  $\text{Me}_2\text{CHPOCl}_2$ ,  $b.$  71.5°,  $d_4^{25}$  1.2970,  $n_D^{20}$  1.4731, and 0.269  $\text{P}_2\text{OCl}_6$ ,  $b.$  70.5°,  $d_4^{25}$  1.2922,  $n_D^{20}$  1.4600;  $\text{Me}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$  gave an unstated distribution between  $\text{Me}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2$ ,  $b.$  78.80°,  $m.$  116-16.5°, and  $\text{Me}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{POCl}_2$ ,  $b.$  61.2°.

47, 1-2,003, 57, 1-1630 (this compd. was also prep'd. by the conventional reaction of chloro- $P(OC_2H_5)_3$  with  $MgCl^+HCl^-$ , followed by hydrolysis and conversion to the chloride).  $(Me_2Cl)_2$  gave 0.018  $Me_2CH_2P(OC_2H_5)_2Me_2$ ,  $b_7$  85.4-105.4°,  $d_7^2$  1.1882,  $n_D^2$  1.4728, and 0.082  $Me_2CH_2Me_2CH_2P(OC_2H_5)_2$ ,  $b_7$  85.7-77°,  $d_7^2$  1.1706,  $n_D^2$  1.4720. Reactions with the chlorides yielded the following products, the yields being those of mixtures of the possible isomers: from  $(CH_3)_2Cl$ , a 5%  $CH_3CH_2CH_2P(OC_2H_5)_2$ ,  $b_7$  70-75°; from  $FeCl_3$ , 8.1%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  65-75°; from  $PCl_5$ , 27.3%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  65-100°; from  $Me_2Cl_2$ , 16.1%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  80-95°; from  $BuCl$  47.2%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  85-120°; from  $Me_2CHCl_2$ , 33.2%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  80-100°;  $Me_2Cl$  gave 3.3%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  75°;  $Me_2CH_2CH_2Cl$  gave 43.5%  $CH_3CH_2P(OC_2H_5)_2$ ,  $b_7$  10-70°. The reaction with ethers is more complex and reactions with  $Et_2O$  and  $Bu_2O$  gave 2 types of products: alkoxylalkane-phosphonyl dichlorides and alkyl dichlorophosphates (with  $Bu_2O$  some  $Cl_2P(OC_2H_5)_3$  was also found); thus, 1 mole  $Bu_2O$  with  $O$  and  $PCl_5$  (3 moles) gave 0.13 mole  $Bu_2P(OC_2H_5)_2Cl$  and 0.2 mole  $Bu_2P(OC_2H_5)_2POCl_3$ , the latter product indicates a reaction similarity to that of the hydrocarbons and the basic process appears to be oxidation of  $PCl_5$  (by  $O_2$  or air; the mechanism of this reaction is not clear at this time), apparently by addn. of  $O$  to form a highly active peroxide-type product having free radical properties and

which yield eventually  $\text{RPoCl}_2$  in various radical reactions, some of which may be:  $\text{ClPOO} + \text{RH} \rightarrow \text{POCl}_2 + \text{R} + \text{OH}$  (21 kcal/3 mol  $\text{PCl}_5$ ) and  $\text{PCl}_5 + \text{R} \rightarrow \text{R}^{\cdot}\text{PCl}_4$ , followed by  $\text{R}^{\cdot}\text{PCl}_4 + \text{RH} \rightarrow (\text{RPoCl}_2) + \text{R}$  and  $(\text{RPoCl}_2) \rightarrow \text{RPoCl}_2 + \text{HCl}$  →  $\text{RPoCl}_2 + \text{HCl}$ . The radical mechanism is supported by fairly large reaction rates even at -30°, the formation of  $\text{RCl}$  in reactions of isopentane and isooctane with  $\text{PCl}_5$  and  $\text{O}_2$  (this probably is shown by  $\text{R}^{\cdot} + \text{OH} \rightarrow \text{ROH}$ ;  $\text{ROH} + \text{POCl}_5 \rightarrow \text{RPoCl}_2 + \text{HCl}$ ;  $\text{ROPOCl}_2 + \text{HCl} \rightarrow \text{RCl} + \text{HPOCl}_2$ ), and the isolation of iso-BuCl and iso-BuPOCl<sub>2</sub> from the reaction with isooctane (representable by cleavage of the RH by  $\text{OH}$  into either  $\text{Me}_2\text{C}^{\cdot}$  and  $\text{Me}_2\text{CHCH}_2\text{OH}$  or  $\text{Me}_2\text{CHCH}_2\text{O}^{\cdot}$  and  $\text{Me}_2\text{COH}^{\cdot}$ ). In addition, hydrocarbons of twinned mol. wt. are isolated from the reaction; e.g., MePh yields  $\text{C}_{10}\text{H}_{18}$ , b. 250-27°, does not freeze at -30°.

indicating formation from  $\text{C}_6\text{H}_6$ . Formation of  $\text{ROPOCl}_2$  in reactions of ethers is not caused by ether cleavage under the exptl. conditions, as neither was the  $\text{R}^{\cdot}\text{O}$  used changed by heating to 170° with  $\text{POCl}_3$  or  $\text{PCl}_5$  7 hrs. in sealed tube, nor did dry  $\text{HCl}$  passed into the ether at room temp. 5 hrs. cause any change. The reaction may be explained by:



$\text{But}^{\cdot}\text{Bu} + \text{BuO}^{\cdot}\text{Bu}$ .  $\text{But}^{\cdot}\text{Bu}$  reacts with  $\text{POCl}_3$  yielding  $\text{ROPOCl}_2$ , while the radical reacts as indicated earlier yielding the phosphonyl dichloride; this radical may also

arise by:  $\text{C}_6\text{H}_6 \cdot \text{O}^{\cdot} \cdot \rightarrow \text{Bu}^{\cdot}\text{O} \rightarrow \text{POCl}_2 + \text{OH} \cdot \rightarrow$

$\text{BuO}^{\cdot}\text{Bu}$ . The products obtained from  $\text{R}^{\cdot}\text{O}$  or  $\text{Bu}^{\cdot}\text{O}$  are listed below.  $\text{EtO}^{\cdot}\text{Et}_2\text{POCl}_2$ , b. 78-81°,  $d_4^{25}$  1.3073, mp. 1.4660;  $\text{BuO}^{\cdot}\text{Et}_2\text{POCl}_2$ , b. 88-111°,  $d_4^{25}$  1.2811;  $\text{EtOPOCl}_2$ , b. 51-2°,  $d_4^{25}$  1.3804,  $d_4^{25}$  1.4350 (prepd. from  $\text{EtOH}$  and  $\text{POCl}_3$ , the product, b. 53-4°,  $d_4^{25}$  1.3835,  $d_4^{25}$  1.4348);  $\text{BuOPOCl}_2$ , b. 61-5°,  $d_4^{25}$  1.2600,  $d_4^{25}$  1.4460.

G. M. Kosolapoff

Soborovskiy, L.Z.

USSR/Chemistry - Reaction processes

Card 1/1 Pub. 151 - 37/38

Authors : Zinov'yev, Yu. M.; Muler, L. I.; and Soborovskiy, L. Z.

Title : Synthesis of organo-phosphorus compounds from hydrocarbons and their derivatives. Part 3.- Reaction of acetylene hydrocarbons with phosphorus trichloride and oxygen

Periodical : Zhur. ob. khim. 24/2, 380-385, Feb 1954

Abstract : The reaction of formation of organo-phosphorus compounds, which takes place during the reaction between acetylene hydrocarbons and their derivatives and phosphorus trichloride and oxygen, is described. The products obtained from such reaction, their structure and properties are listed. The effect of the oxygen on the reaction process is explained. Nine references: 4-USA; 3-USSR and 2-German (1932-1951). Tables.

Institution : ...

Submitted : July 29, 1953

Evaluation in B-76774, 7 July 54

Soborovskiy, L.Z.  
USSR/Chemistry - Synthesis

Card 1/1 : Pub. 151 - 24/37

Authors : Soborovskiy, L. Z., and Zinovyev, Yu. M.

Title : Synthesis of organo-phosphorus compounds from hydrocarbons and their derivatives. Part 4.-Formation of dialkylphosphinic acid derivatives from alkylchlorophosphines, hydrocarbons and oxygen

Periodical : Zhur. ob. khim. 24/3, 516-519, Mar 1954

Abstract : The formation of a C - P bond during the reaction of aliphatic hydrocarbons or their chloro-derivatives, with oxygen and alkylchlorophosphines, was established experimentally. The synthesis of secondary (mixed) dialkylphosphinic acid chlorides is described. The reaction between methyl- or ethylchlorophosphines and propane, cyclohexane and allyl chloride was investigated and the products obtained are listed. Seven references: 3-USSR; 2-USA and 2-German (1880-1954). Table.

Institution : .....

Submitted : July 29, 1953

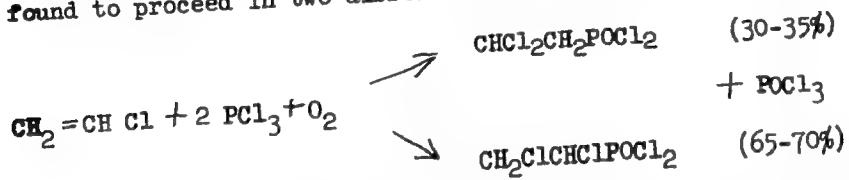
ZINOV'YEV, Yu.M.; SOBOROVSKIY, L.Z.

Synthesis of organophosphoric compounds from hydrocarbons and their derivatives. Part 6. Oxidizing chlorophosphination of cyclohexane and propylene by phenyldichlorophosphine. Zhur. ob. khim. 26 no.11:3030-3032 (MIRA 10:1)  
N '56.  
(Propylene) (Cyclohexane) (Phosphine)

*S. 100*

"Oxidative Chlorophosphonation of Chlorine Substituted Olefins," by L. Z. Soborovskiy, Yu. M. Zinov'yev, and L. I. Muler, Doklady Akademii Nauk SSSR, Vol 109, No 1, Jul 56, pp 98-100

Oxidative chlorophosphonation is defined as the reaction between hydrocarbons (or their derivatives), oxygen, and phosphorous trichloride (or products where part of the chlorine is substituted by organic groups, e.g.,  $\text{PCl}_2\text{R}$  or  $\text{PClR}_2$ ). In the case of vinyl chloride, this reaction was found to proceed in two different directions:



The yield of the reaction product in the oxidative chlorophosphonation of allyl chloride was too low to say for sure that the reaction proceeded in one direction only. (U)

*Soropovskiy, L. Z.*

4  
XII, 4,4-Tetrachlorobutane. Yu. M. Zinov'ev, V. N. ~~et al.~~ 484 f  
Kulikov and ~~L. Z. Soropovskiy~~ U.S.S.R. 105,343, Apr. 25, 1957.  
A mixt. of  $\text{CH}_3\text{CHCl}$  and  $\text{PCl}_3$  is heated in a  
steel autoclave at  $100-10^{\circ}$  and the products are sep'd. by the  
usual method. M. Hoseh.

*GM any*

SOBOROVSKIY, L. Z.

Reaction of phosphorus pentachloride with some halo-  
genated  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$  (V. M. Zinov'ev, V. N. Kulakova, and L. Z.  
Soborovskiy, Zhur. Obshch. Khim., 27, 151-6 (1957)).  
Passage of  $\text{CH}_2\text{:CHCl}$  15 hrs. through a suspension of 52 g.  
 $\text{PCl}_5$  in 300 ml.  $\text{C}_6\text{H}_6$  at 20° followed by passage of  $\text{SO}_2$  (40  
ccm) convert the products to workable form and distil; gave  
mainly  $\text{POCl}_4$ ; treatment of the product with  $\text{H}_2\text{O}$  left be-  
hind but 1 g.  $\text{CH}_2\text{:CHClCH}_2\text{Cl}$ . Heating 208 g.  $\text{PCl}_5$  and 100 g.  
 $\text{CH}_2\text{:CHCl}$  in autoclave 12 hrs. at 110° gave 31%  $\text{CHCl}_2$   
 $\text{CH}_2\text{:CHCl}$  and 33.6% ( $\text{CH}_2\text{:CHCl}_2$ ) (I), b.p. 52-4°, vis. 200°, ds.  
1.4477, n<sub>D</sub><sup>20</sup> 1.4993. Heating 35 g.  $\text{CH}_2\text{:CHCl}$  and 62 g.  
 $\text{SO}_2\text{Cl}_2$  in an autoclave 15 hrs. at 110° gave 18%  $\text{CHCl}_2$   
 $\text{CH}_2\text{:CHCl}$ . Treatment of 20 g. I with 13 g. KOH in EtOH in 2  
hrs. gave 2 g. 1,4-dichloro-1,3-butadiene (II), b.p. 54-5°, ds.  
1.2037, n<sub>D</sub><sup>20</sup> 1.5118, and 1,1,4-trichloro-1-butene, b.p. 101°,  
1.3530, 1.4960. No reaction took place when  $\text{CH}_2\text{:CHCl}$  and  
 $\text{PCl}_5$  were stirred in  $\text{C}_6\text{H}_6$  12 hrs. at room temp.  
Heating 16.3 g.  $\text{CH}_2\text{:CHClCH}_2\text{Cl}$  and 50 g.  $\text{PCl}_5$  in an auto-  
clave 14 hrs. at 120-30° gave 54.1 g. products from which  
was isolated a series of fractions b.p. to 130°; from these was  
isolated some 1,2,5,6-tetrachlorohexane, b.p. 94-100°, ds.  
1.4043, n<sub>D</sub><sup>20</sup> 1.5136. Heating  $\text{PCl}_5$  with  $\text{CH}_2\text{:CCl}_2$  8 hrs. at  
130° gave unreacted  $\text{PCl}_5$  and vinylidene chloride polymer.  
Passage of  $\text{C}_6\text{H}_6$  through  $\text{PCl}_5$  suspended in  $\text{C}_6\text{H}_6$  until no  
evident change occurred gave after evapn. of the solvent  
116 g. crude  $\text{MeCHClCH}_2\text{PCl}_5$ , which was heated in an  
autoclave 10 hrs. at 100-10° yielding 121 g. liquid and some  
dark tar. The liquid portion was shown to be mainly  $\text{PCl}_5$   
and  $\text{C}_2\text{H}_5\text{CHCl}_2\text{Me}$ , along with some 2,2,5,5-tetrachloro-  
hexane, b.p. 80°, ds. 1.3529, n<sub>D</sub><sup>20</sup> 1.5233. The formation of  
chloroalkanes of double the chain length of initial olefins is  
explainable by initial formation of the 1,2-adduct of  $\text{Cl-PCl}_5$  at the olefinic bond, followed by decompos. of the ad-  
duct to the tetrachloroalkane of double chain length, along  
with  $\text{PCl}_5$  and  $\text{PCl}_3$ , with a competing reaction of cleavage  
directly to a 1,2-dichloro deriv. and  $\text{PCl}_3$ . Infrared spec-  
trum of II is shown, confirming the proposed structure.

G. M. Kosolapoff

5  
1-4E49

SOBOROVSKIY, L.Z.

Distr: 4E3d/4E4j/  
4E2c(j)

Preparation of 2-fluoromethyl ether of ethylene glycol,  
Yu. M. Zinov'ev, V. N. Kulakova, and L. Z. Soborovskii,  
Zhur. Obshchey Khim. 27, 2558-9 (1957).  
Reaction of a mixture of 2-fluoroethanol and 2-fluoroethoxyethanol with ice cooling followed by distillation  
to 34.71 g.  $\text{FCH}_2\text{CH}_2\text{OH}$  with ice cooling followed by distillation to 34.71 g.  $\text{FCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OH}$ , b.p.  
169-71°, d<sub>4</sub> 1.1218, n<sub>D</sub> 1.4070. It was impossible to isolate the Na alcoholate of  $\text{FCH}_2\text{CH}_2\text{OH}$ . G. M. K.

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Soborovskiy L.Z.

79-2-5/64

## AUTHORS:

Yakubovich, A. Ya., Soborovskiy, L. Z., Muler, L. I., Fayernmark,  
V. S.

## TITLE:

Syntheses of Vinylmonomers. 1.  $\alpha$ -Substituted Derivatives of Vinyl-  
phosphinic Acid (Sintezy vinilovykh monomerov. 1.  $\alpha$ -zamoshchennyye  
proizvodnyye vinilfosfinovoy kisloty)

## PERIODICAL:

Zhurnal Obschchey Khimii, 1958, Vol. 28, Nr 2, pp. 317-319 (USSR)

## ABSTRACT:

Of the alkenylphosphine derivatives the  $\alpha$ -methylvinylphosphinic acid (reference 1), the diethylether of  $\alpha$ -carboxethoxyvinylphosphinic acid (reference 2) and the diethylether of cyanovinylphosphinic acid (reference 3) are known. The authors synthesized some derivatives analogous to the above-mentioned compounds by the method of phosphinoxidation. In the oxidation of the mixture of methyl acrylate and phosphorus trichloride by means of oxygen the chlorine anhydride of chlorocarbonethoxyethylphosphinic acid forms. The attempts to produce an analogous chlorine-substituted derivative of vinylphosphinic acid, which was not described in publications, according to the method by Pudovik (reference 6) from vinylidene chloride and dialkylphosphite failed. Chlorocyanooethylphosphine derivatives by whose dichlorination the compounds of cyanovinylphosphine can be obtained were synthesized by means of phosphinox-

Card 1/2

79-2-5/64

Syntheses of Vinylmonomers. 1.  $\alpha$ -Substituted Derivatives of Vinylphosphinic Acid

dation of vinyl cyanide. The liquid isomer under the influence of triethylamine easily separates the hydrogen-chloride elements and forms the dimethylester of cyanovinylphosphinic acid; the position of the cyanogen group has not yet been determined for this compound. The attempts of synthesizing the chlorocyanooethylphosphinic derivatives by addition of phosphorus pentachloride to vinyl cyanide did not yield any positive results. The chlorination of acrylonitrile with the formation of dichloropropionitrile can even be observed at  $-(15 - 20^{\circ}\text{C})$ . The dimethylether of vinylphosphinic acid, not described earlier, was synthesized according to the usual method. The ethers of the substituted vinylphosphinic acid form polymers and copolymers with other vinylmonomers. Summary: 1) By phosphin-oxidation of methylacrylate and acrylonitrile, chlorine anhydrides of the corresponding chlorocarbomethoxy- and cyanochloro-substituted ethylphosphinic acids were obtained. On treatment of the latter their ether was obtained. 2) By dehydrochlorination of the above-mentioned ethers the cyanogen chloride and carbon chloride methoxy-substituted ethers of vinylphosphinic acids were synthesized. There are 6 references, 4 of which are Slavic.

SUBMITTED:  
AVAILABLE:  
Card 2/2

April 25, 1957  
Library of Congress

Soborevskiy, I. Z.

75-2-16/61

AUTHORS:

Bruker, A. B., Spiridonova, I. G., Soborevskiy, I. Z.

TITLE:

Investigation of the Reaction of Tetrafluoroethylene With Trichloroarsenic in the Presence of Aluminum Chloride (Issledovaniye reaktsii tetrakloroetilena s trekhkloristym aluminium v prisutstvii khlorista aluminija)

PERIODICAL:

Zhurnal Obshchey Khimii, 1952, Vol. 22, No. 2, PP. 350 - 355 (USSR)

ABSTRACT:

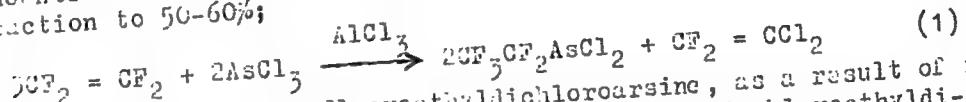
In the present work the authors investigated the reaction of trichloroarsenic with tetrafluoroethylene. The interaction between trichloroarsenic and unsaturated compounds is only investigated in the example of the reaction with acetylene (references 2 - 7). It is less thoroughly investigated with ethylene. Ron's'ou, Vor and Bokrusov (references 8 and 9) showed that on saturation of trichloroarsenic with ethylene in the presence of dehydrated aluminum chloride, under atmospheric pressure and at an ordinary temperature the formation of  $\beta$ -chloroethyl dichloroarsine with a small yield takes place. The authors originally tried to perform the interaction between tetrafluoroethylene and trichloroarsenic under conditions analogous as in the reaction with ethylene. The results were negative. Just as negative were the attempts which were performed in an autoclave under pressure, but without aluminum chloride. Upon

Card 1/4

79-2-16/64

Investigation of the Reaction of Tetrafluoroethylene With Trichloroarsenic in the  
Presence of Aluminum Chloride

Closer examination of this reaction it was found that in the interaction between trichloroarsenic and tetrafluoroethylene in the presence of aluminum chloride a substance is produced which contains carbon, fluorine, chlorine and arsenic. This substance was identified as the hitherto unknown pentafluoroethyl dichloroarsine. Beside it another substance was eliminated from the reaction mixture which corresponds to 1,1-difluoro-2,2-dichloroethylene described in publications (reference 10). The theoretical yield of pentafluoroethyl dichloroarsine according to the trichloroarsenic reacted through amounts to 70 %, according to the tetrafluoroethylene used in the reaction to 50-60%;

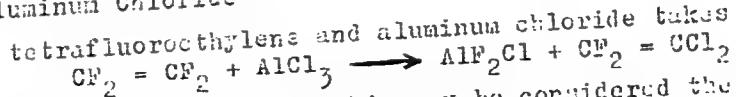


The formation of pentafluoroethyl dichloroarsine, as a result of reaction (1), instead of the expected tetrafluoro- $\beta$ -chloroethyl dichloroarsine indicated the difference of this process from the usual reaction in which trichloroarsenic is added to unsaturated compounds. The explanation for this lies in the capability of aluminum chloride to exchange the chlorine atom with fluorinated organic hydrocarbons against fluorine (references 11-15). It seems probable that in the observed case at first an exchange of halides between

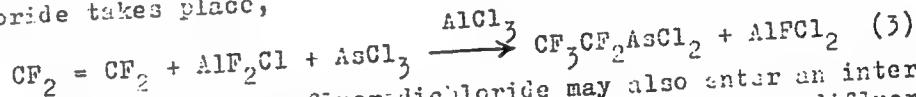
Card 2/4

70-2-15/64  
 Investigation of the Reaction of Tetrafluoroethylene With Trichloroarsenic in the  
 Presence of Aluminum Chloride

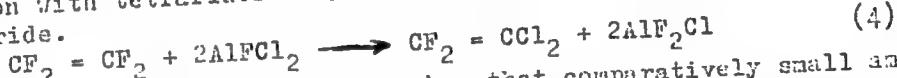
tetrafluoroethylene and aluminum chloride takes place. (2)



As a confirmation of this may be considered the fact that in all these tests simultaneously with pentafluoroethylidichloroarsine, difluorodichloroethylene was separated in a ratio corresponding to that in equation (1). Further the formation of pentafluoroethylidichloroarsine and aluminum fluorodichlorides under interaction of tetrafluoroethylene with trichloroarsenic and aluminum difluorochloride takes place,



The resulting aluminum fluorodichloride may also enter an interaction with tetrafluoroethylene and again form aluminum difluorochloride.



The schemes given sufficiently show that comparatively small amounts of aluminum chloride are sufficient for converting considerable amounts of tetrafluoroethylene to pentafluoroethylenedichloroarsine and difluorodichloroether (see table). Summary: 1) The authors

Card 3/4

79-2-15/64

Investigation of the Reaction of Tetrafluoroethylene With Trichloroarsenic in the  
Presence of Aluminum Chloride

realized the reaction of tetrafluoroethylene with trichloroarsenic in the presence of aluminum chloride at elevated temperatures and under pressure. They expressed their opinion on the mechanism of this process. The pentafluoroethyl dichloroarsine not described was separated as main products. 2) Pentafluoroethyl difluoroarsine, pentafluorethylarsine and pentafluoroethylarsenic acid hitherto not described in publications were produced and characterized. There are 1 table, and 16 references, 1 of which is Slavic.

- SUBMITTED: February 2, 1957
- AVAILABLE: Library of Congress

Card 4/4

AUTHORS: Zinov'yev, Yu. M., Kulakova, V. N., Sov / 79-28-6-25/63  
Soborovskiy, L. Z.

TITLE: The Synthesis of Organophosphorus Compounds of Hydrocarbons and  
Their Derivatives (Sintez fosfororganicheskikh soyedineniy iz  
uglevodorodov i ikh proizvodnykh) VII. Oxidizing Chlorophosphi-  
nation With Alkoxy- and Dialkylamidodichlorophosphines (VII.  
Okislitel'noye khlorfosfinirovaniye alkaksi-i dialkilamidodi-  
khlorfosfinami)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 6,  
pp. 1551 - 1554 (USSR)

ABSTRACT: Contrary to the method (Ref 1) employed in an earlier paper by  
the authors they now prove that alkoxydichlorophosphines and  
dialkylamidodichlorophosphines can be used as phosphination  
agents, i.e. compounds in which the hydrocarbon radical is com-  
bined with the phosphorus by means of a third element:  
$$RH + 2R'XP\bar{Cl}_2 + O_2 \longrightarrow RP(O)(XR')Cl + R'XP(O)Cl_2 + HCl$$
, where R and R'  
are hydrocarbon radicals and where X is equal to O or to N. By  
means of the mentioned reagents the oxidizing chlorophosphination  
of cyclohexane with ethoxydichlorophosphine and vinylchloride

Card 1/3

The Synthesis of Organophosphorus Compounds of Hydrocarbons and Their Derivatives. VII. Oxidizing Chlorophosphination With Alkoxy- and Dialkylamidodichlorophosphines

30V/79-28-6-25/63

with methoxydichlorophosphine and dimethylamidodichlorophosphine was carried out. The corresponding chlorine anhydrides containing a phosphorushydrocarbon bond were separated as final products. The chlorophosphination of cyclohexane with ethoxydichlorophosphine lead to a mixture of compounds the separation of which by fractionation was difficult. In order to prove that this reaction actually takes place according to the above mentioned scheme the mass obtained was hydrolyzed and the cyclohexanephosphinic acid was separated from the products of hydrolysis. Also with the compounds of the ethylene series oxidizing chlorophosphination with alkoxydichlorophosphines takes place in a manner similar to the reaction carried out with phosphorus trichloride; the vinyl chloride was used for this purpose. The chlorine anhydride and the ethyl ester of dimethylamidodichloroethanephosphinic acid, the dimethyl ester of dichloroethanephosphinic acid and the methyl ester of dichloroethanechlorophosphinic acid were synthetized. There are 3 references, which are Soviet.

SUBMITTED: May 12, 1957

Card 2/3

30V 79-28-6-45/63

The Synthesis of Organophosphorus Compounds From Hydrocarbons and Their Derivatives. VIII. The Investigation of Oxidation of Phosphorus Trichloride With Oxygen

aryl.. and alkyl radicals, alkoxyl.., dialkylamine.. and other monovalent organic groups) with a single passage of gaseous oxygen or air can be obtained by means of the mentioned reagents. Earlier the assumption was made that the oxidation chlorophosphination as well as the oxidation of phosphorus trichloride have radical character. According to this assumption in the oxidation of phosphorus trichloride first the binding of oxygen to this substance takes place. The formed compound can be either regarded as biradical ( $\text{Cl}_3\text{POO}$ ) or as bipolar ion ( $\text{Cl}_3\text{POO}^{\cdot}\text{:PCl}_3 + \text{O}_2 \rightarrow \text{Cl}_3\text{POO}^{\cdot}$ ). This adduct

converts immediately with a second molecule  $\text{PCl}_3$  and forms phosphoroxychloride:  $\text{Cl}_3\text{POO}^{\cdot} + \text{PCl}_3 \rightarrow 2\text{POCl}_3$ . When a hydrocarbon (RH) is present in the reaction mixture it can be included in the reaction. The biradical  $\text{Cl}_3\text{POO}^{\cdot}$  forms the organic radical  $\text{R}^{\cdot}$  and the radical  $\text{OH}^{\cdot}$ :  $\text{Cl}_3\text{POO}^{\cdot} + \text{RH} \rightarrow \text{POCl}_3^{\cdot} + \text{R}^{\cdot} + \text{OH}^{\cdot}$  on the occasion of the collision with the molecule RH. Either of these radicals can lead to the formation of the chlorine anhydrides of the corresponding alkanephosphinic acids. The initial stage of the oxidation of phosphorus tri-

Card 2/3

The Synthesis of Organophosphorus Compounds From Hydrocarbons and Their Derivatives. VIII. The Investigation of Oxidation of Phosphorustrichloride With Oxygen SOV/79-28-6-45/63

chloride with oxygen is a heterogeneous process dependent on the velocity of solution of the oxygen. The oxidation velocity of phosphorus trichloride with gaseous oxygen does in no case depend on the temperature. The activation energy of this oxidation is very small which fact points to the assumed free-radical character of this process. There are 4 figures and 11 references, 10 of which are Soviet.

SUBMITTED: May 29, 1957

1. Phosphorus chlorides--Oxidation

Card 3/3

sov/79-28-7-30/64

AUTHORS: Soborovskiy, L. Z., Gladshteyn, B. M., Kiseleva, M. I.,  
Chernetkiy, V. N.

TITLE: Investigation in the Series of Organosulfur Compounds  
(Issledovaniye v ryadu organicheskikh soyedineniy sery)  
I. The Synthesis of the Fluoranhydrides of Alkanesulfo Acids  
and Their Halogen Derivatives (I. Sintez ftorangidridov al-  
kansul'fokislot i ikh galoidoproizvodnykh)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 7, pp. 1866-1870  
(USSR)

ABSTRACT: The fluoranhydrides of aliphatic sulfo acids are little in-  
vestigated. Some of them are of practical value, as, for  
instance, methane sulfofluoride which is an effective in-  
secticide. In the present paper the authors realized the  
synthesis of some alkane sulfofluorides and their halogen  
derivatives (comprising some not yet described in publica-  
tions); they do so according to the general scheme  
$$\text{RSO}_2\text{Cl} \xrightarrow{\text{RF, Zn-F}_2} \text{RSO}_2\text{F}$$
. The synthesis of the first member,

Card 1/3

Investigation in the Series of Organosulfur Compounds. I. The Synthesis of  
the Fluoranhydrides of Alkanesulfo Acids and Their Halogen Derivatives

SOV/79-28-7-30/64

of methane sulfofluoride, according to the method by Davis, Dick (Devis, Dik) cannot be carried out. The authors succeeded in obtaining in good yield methane sulfofluoride from methane sulfochloride by the action of potassium fluoride on it; the fluoride could be distilled off by means of steam without any admixtures. The same way the authors synthesized the hitherto unknown n.- and isopropane sulfofluorides, as well as the iodomethane sulfofluoride which could not be obtained according to the method by Davis. Thus the authors synthesized the hitherto unknown fluoranhydrides n-propane-, isopropane-, iodomethane,  $\beta$ -fluorethane-,  $\beta$ -chlorethane-,  $\beta$ -bromethane-,  $\beta$ -nitroethane- and  $\beta,\beta$ -dichlorethane sulfo acids. It was shown that the heating of the methane-, n.-propane-, isopropane- and iodomethane sulfochlorides with a saturated solution of potassium fluoride and with uninterrupted distillation of the forming sulfofluoride by means of steam represents a convenient preparative method for the synthesis of the above mentioned compounds. There are 14 references, 6 of which are Soviet.

Card 2/1  
2

Submitted May 57

SOV/79-28-7-31/64

AUTHORS: Soborovskiy, L. Z., Gladshteyn, B. M., Chernetskiy, V. N.,  
Kiseleva, M. I.

TITLE: Investigation in the Series of Organic Sulfur Compounds  
(Issledovaniya v ryadu organicheskikh soyedineniy sery)  
II. The Synthesis of the Fluoranhydrides of Alkenesulfo Acids  
and Their Halogen Derivatives (II. Sintez ftorangidridov  
alkensul'fokislot i ikh galoidoproizvodnykh)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 7, pp. 1870-1873  
(USSR)

ABSTRACT: Continuing the previous paper (Ref 1) on the effect of potassium fluoride on some alkane sulfochlorides under the convenient preparative production of alkane- and halogen-alkane sulfofluorides the authors carried out the investigation of the reaction of potassium fluoride with halogen-substituted ethanesulfochlorides; it was found that besides the substitution of the chlorine anhydride by fluorine another dehydration and dehalogenation takes place with unsaturated sulfo chlorides being obtained as final products

Card 1/3

SOV/79-28-7-31/64

Investigations in the Series of Organic Sulfur Compounds. II. The Synthesis of the Fluoranhdyrides of Alkenesulfo Acids and Their Halogen Derivatives

(see scheme 1). The property of potassium fluoride to cleave off the hydrogen halide from two adjacent carbon atoms made it possible to realize the direct transition from the halogen derivatives of alkane sulfochloride to the sulfo fluorides of the unsaturated series in one stage in good yields. Hitherto only one such representative has been known, the vinyl sulfofluoride (Ref 3). This reaction was used for the synthesis of the fluoranhdyrides of the unsaturated aliphatic sulfo acids and their halogen derivatives, the constants of which are given in table 1. The halogenalkane sulfochlorides (as given in scheme 2) served as initial products for the synthesis of the sulfofluorides of the unsaturated type and their halogen derivatives, although the yield of the obtained  $\beta$ -chlorethane sulfochloride was small. Concluding it may be said that the vinyl sulfofluoride and the  $\beta$ -chlorovinyl sulfofluoride (in two stereoisomeric forms) were synthesized in the way described. There are 11 references, 4 of which are Soviet.

Card 2/3

GLADSHTEYN, B.M.; CHERNETSKIY, V.N.; KISELEVA, M.I.; SOBOROVSKIY, L.Z.

Sulfur organic compounds. Part 3: Properties of haloalkene, alkene  
and haloalkenesulfofluorides. Zhur. ob. khim. 28 no. 8:2107-2111  
Ag '58. (MIRA 11:10)

(Sulfur organic compounds)

BRUKER, A.B.; FRENKEL', R.I.; SOBOROVSKIY, L.Z.

Preparation of esters of fluoantimonic and fluotitanic acids by  
reacting antimony trifluoride with complete esters of these acids.  
Zhur.ob.khim. 28 no.9:2413-2416 S '58. (MIRA 11:11)  
(Titanic acids) (Antimony fluorides)

GLADSHTEYN, B.M.; KULYULIN, I.P.; SOBOROVSKIY, I.Z.

Sulfur organic compounds. Part 4: Synthesis of  $\beta$ -chloroethane-chlorosulfonate. Zhur. ob. khim. 28 no.9:2417-2419 S '58.  
(Chlorosulfonates) (MIRA 11:11)

AUTHORS:

Zinov'yev, Yu. M., Soborovskiy, L. Z. SOV/79-29-2-55/71

TITLE:

Synthesis of Phospho-organic Compounds From Hydrocarbons and Their Derivatives (Sintez fosfororganicheskikh soyedineniy iz ulla vodorodov i ikh proizvodnykh). IX. Oxidizing Chlorophosphination of Butene-1, Butene-2, and Cyclohexene (IX. Okis-litel'noye khlorfosfinirovaniye butena-1, butena-2 i tsiklo-geksena)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 2, pp 615-619 (USSR)

ABSTRACT:

In their earlier paper dealing with the reaction of hydrocarbons with  $PCl_3$  and oxygen the authors pointed out that butene-1 is transformed by the reaction into chloric anhydride of the chlorobutane phosphinic acid (Ref 1) with the structure remaining open. In the present paper this anhydride is shown to be a mixture of isomeric compounds. On expelling relatively large amounts of this product (500 gr) fractions were separated having the same composition but different boiling temperatures. Oxidizing chlorophosphination of butene-2 led to the same chloric anhydride. However, it boiled within narrow limits. Constants and

card 1/3

Synthesis of Phospho-organic Compounds From Hydro- SOV/79-29-2-55/71  
carbons and Their Derivatives. IX. Oxidizing Chlorophosphination of Butene-1,  
Butene-2, and Cyclohexene

probably apply to it. For this reason in these compounds the structure of chloric anhydride must be ascribed to 2-chloro-butane phosphinic acid-3. Thus in the oxidizing chlorophosphination of butene-1 the above compound may form only according to scheme 2. The other fraction is apparently a mixture from the chloric anhydrides of 2-chlorophosphine-1 and 1-chloro-phosphinic acid-2, forming according to scheme 1. The table shows that reaction 2 predominates. Also isomeric chloric anhydrides of cyclohexene- and chlorohexane phosphinic acid were synthesized. There are 1 table and 7 references, 5 of which are Soviet.

SUBMITTED: January 3, 1958

Card 3/3

Synthesis of Organo-phosphorus Compounds From  
Hydrocarbons and Their Derivatives. X. Oxidation  
Chlorophosphination of Some Ethylene Derivatives

SOV/79-29-4-21/77

of vinyl chloride under the formation of isomers which differ from one another by the relative position of chlorine and the radical  $\text{POCl}_2$  (Ref 2). These acid chlorides synthesized in this paper apparently form also a mixture of two isomers of the structure  $\text{CH}_2\text{ClCHXP(O)Cl}_2$  and  $\text{CHClXCH}_2\text{P(O)Cl}_2$ . In particular for the product of the reaction of vinyl fluoride with phosphorus trichloride and oxygen experimental data are available on the occurrence of isomers, the separation of which will be the subject of a special report. The reaction product of the oxido-chlorophosphination of vinyl bromide was divided by fractionation into two fractions which differ not only by the boiling temperature but also by their composition. The low-boiling fraction proved to be the acid chloride of bromo-vinyl-phosphinic acid, while the higher boiling one was the acid chloride of chloro-bromo-ethane phosphinic acid. The formation of the first compound probably results

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Synthesis of Organo-phosphorus Compounds From  
Hydrocarbons and Their Derivatives. X. Oxidation  
Chlorophosphination of Some Ethylene Derivatives

SOV/79-29-4-21/77

from the second dehydrogenation reaction of the acid chloride of chloro-bromo-ethane phosphinic acid in the distillation. Reference 2 confirms that the low-boiling product is the 2-bromine-substituted substance, while forms the higher boiling one the 1-chloro-2-bromo-derivative, and accordingly their formulae are  $\text{BrCH}_2\text{CHP}(\text{O})\text{Cl}_2$  and  $\text{CH}_2\text{BrCHClP}(\text{O})\text{Cl}_2$  (Table). As by-product of the reaction of chlorine with vinyl bromide the 1,2-dichlorobromide ethane hitherto unknown was obtained. Consequently, the synthesis covered the acid chlorides of 1-chloro-2-bromo-, 1,2,2,-trichloro-, fluorochloro-, fluorodichloro- and chloro-(fluorosulfo)-ethane phosphinic acid. There are 1 table and 5 Soviet references.

SUBMITTED: March 3, 1958

Card 3/3

5 (1)

AUTHOR: Yel'chenko, I. A. et al.

TITLE:

Difluor Monochlor Methane as a Diffusion-Controlling Agent  
(Difluorochlormethan kak diffuzionno-kontrol'nyy agent).  
I. Reaction of Difluor Monochlor Methane (Freon-22) with  
Alcohoiates and Sodium Chloroformate (I. reaktsiya  
difluorochlormetana s alkoholiatami i s sodii-kloroformatom)

JOURNAL:

Zhurnal obshchey khimii, 1959, vol. 29, no. 10, pp. 1142-1143  
(ZOTR)

ABSTRACT:

The chemical properties of difluor monochlor methane synthesized already in 1951 (Ref 1) have not yet been described in detail. Only its pyrolytic transformation into tetrafluoroethylene (Ref 2) and the formation of fluoroform by its reaction with  $AlCl_3$  at low temperature are known. It is generally assumed that the freons, among them also difluor monochlor methane are very inert compounds from the chemical point of view. The authors, however, found that the chlorine atom in the molecule of difluor monochlor methane is comparatively mobile. It could be seen that freon-22 reacts already at room temperature with alcohoiates and sodium

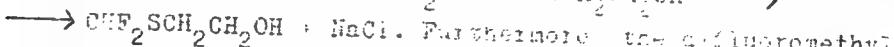
Card 1/2

Difluor Monochlor Methane as a Difluoromethylating Agent. I. Reaction of Difluor Monochlor Methane (Freon-22) With Alcoholates and Sodium Mercaptides

mercaptides in anhydrous alcohol, yielding fluorinated ether and fluorinated sulfides according to the scheme:



$\text{CHF}_2\text{Cl} + \text{NaSR} \longrightarrow \text{CHF}_2\text{SR} + \text{NaCl}$ . These reactions proceed very smoothly already when passing freon-22 through alcoholic solutions of sodium alcoholates. In this way methyl-difluoromethyl- and n.-butyl-difluoromethyl ether were obtained. In the reaction of sodium- $\beta$ -oxo-ethylmercaptide with freon-22 in an alcoholic medium the  $\beta$ -mercapto-difluoromethyl sulfide hitherto unknown resulted in good yield according to the scheme  $\text{CHF}_2\text{Cl} + \text{NaCH}_2\text{CH}_2\text{SH} \longrightarrow$



Furthermore the difluoromethyl ether of the acetoxime, so far unknown as well, was synthesized by O. I. Volskova according to reference 4 (last scheme). There are 4 references, 3 of which are Soviet.

\* Card 2/2

5 (3)

AUTHORS:

Soborovskiy, L. Z., Bainu, N. F.

SOV/75-29-4-23/77

TITLE:

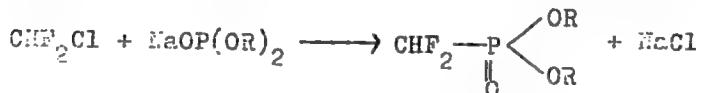
Dichloromethane as Difluoromethylating Agent (Diftorkhlorometan kak diflormetiliruyushchiy agent). II. Reaction of Difluor Monochlor Methane With Sodium-dialkyl-phosphites (II. Reaktsiya diftorkhlorometana s natriydialkifosfitami)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, № 7,  
pp 1134-1146 (USSR)

ABSTRACT:

In the present paper the attempt is made to use difluor monochlor methane in the reaction of Michaelis-Becker with the sodium derivatives of dialkyl-phosphorous acids in order to obtain the corresponding difluoromethyl phosphinates. Difluor monochlor methane was found to react with the sodium derivatives of dialkyl-phosphorous acids in an inert solvent under the formation of difluoromethylphosphinates:



Card 1/3

This reaction proceeds the most readily in the sodium derivatives of the highest dialkyl-phosphorous acids, in

Dichloromethane as Difluoromethylating Agent. SOV/79-2/-1-23/77  
II. Reaction of Difluor Monochlor Methane With Sodium-dialkyl-phosphites

In particular in the case of dibutyl phosphite which is known to be easily soluble in liquid hydrocarbons (Ref 4). On the passing of difluor monochlor methane through the benzine solution of sodium dibutyl phosphite the dibutyl-difluoromethyl phosphinate was thus formed (70 % yield). In the same way the dimethyl-, diethyl- and diisopropyl-difluoromethyl phosphinate were obtained. The anomaly observed in the reaction of difluor monochlor methane with sodium dimethyl phosphite, where instead of the dimethyl-difluoro methyl phosphinate to be expected dimethyl phosphite and a small account of the expected ester are separated, is due to the fact that the system sodium-dimethyl phosphite in the methanol solution is equilibrated with sodium dimethyl phosphite and methanol (Scheme 2). The equilibrium is usually shifted to the right and the reaction proceeds according to Scheme 3. The reaction of dibutyl difluoromethyl phosphinate with phosphorus pentachloride yielded the hitherto unknown acid dichloride of difluoromethyl phosphinic acid. A cleavage of the P-C-bond was thus found to take place due to the influence exercised by  $PCl_5$  upon difluoromethyl phosphinates

Card 2/3

Dichloromethane as Difluoromethylating Agent. SOV/79-29-4-23/77  
II. Reaction of Difluor Monochlor Methane With Sodium-dialkyl-phosphites

in addition to the formation of the acid dichloride of difluoromethyl phosphinic acid, with the formation of the corresponding alkyl phosphates. There are 5 references, 1 of which is Soviet.

SUBMITTED: March 6, 1958

Card 3/3

AUTHORS:

Bystrova, R. I., Zinov'yev, Yu. M.,  
Soborovskiy, L. Z.

sov/79-29-6-68/72

TITLE:

Synthesis of Organo-phosphoric Compounds From Hydrocarbons and  
Their Derivatives (Sintez fosfororganicheskikh soyedineniy iz  
uglevodorodov i ikh proizvodnykh). XI. Oxidizing Chlorophosphi-  
nation of Nitriles (XI. Okislitel'noye khlorfosfinirovaniye  
nitrilov)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 6, pp 2088-2092 (USSR)

ABSTRACT:

In the reaction of the oxidizing chlorophosphination of hydro-  
carbons and their derivatives the C-P-linkage results; at the  
same time acid chlorides of corresponding alkane-phosphinic  
acids are formed. The reaction was carried out by halogen  
substituted paraffin hydrocarbons and by halogen olefins. The  
oxidizing chlorophosphination of alkoxy substituted hydro-  
carbons of ethers (Refs 1,2) is also possible. In the present  
paper the authors analyzed the reaction of phosphorus tri-  
chloride and oxygen with cyano substituted paraffins (nitriles  
of carboxylic acids). It was shown, that the oxidizing chloro-  
phosphination of nitriles may proceed in two directions. The  
acid nitriles with 4 and more C-atoms per molecule form acid

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Synthesis of Organo-phosphoric Compounds From Hydro- SOV/79-29-6-68/72  
carbons and Their Derivatives. XI. Oxidizing Chlorophosphination of Nitriles

chlorides of the cyan alkane phosphinic acids  $C_nH_{2n}(CN)P(O)Cl_2$ ,  
i.e. of compounds containing a C-P-linkage. The first links of  
the nitrile series (acetonitrile, propionitrile), as well as  
benzonitrile, form in the reaction with  $PCl_3$  and  $O_2$ , compounds

which contain the P-N-linkage, i.e. derivatives of acid chlo-  
rides of the imido-N-phosphoric acids, which correspond to the  
formula  $RCOCl=NP(O)Cl_2$ . Acid chlorides of the cyanopropane and

the cyanobutane-phosphinic acids have been synthesized. Two  
acid chlorides of the imido-N-phosphoric acid have been obtained  
whose structure corresponds probably to the formulas  
 $C_2H_5CCl=NP(O)Cl_2$  and  $C_6H_5CCl=NP(O)Cl_2$ . The acid chloride  
of the imido-N-phosphoric acid, which is formed from aeto-  
nitrile, could not be separated in pure state. For the nitriles  
of carboxylic acids, which contain more than three C-atoms, the  
oxidizing chlorophosphination is carried out according to  
scheme (1), and for the acetonitrile, propionitrile, and benzo-  
nitrile according to scheme (2), and leads to the P-N-linkage.  
The spectroscopic analyses have been carried out by

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Synthesis of Organo-phosphoric Compounds From Hydro- SOV/79-29-6-68/72  
carbons and Their Derivatives. XI. Oxidizing Chlorophosphination of Nitriles

N. P. Rodionova, S. S. Dubov, and V. V. Fedotova. There are  
1 table and 5 Soviet references.

SUBMITTED: March 3, 1958

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5(3)

AUTHORS:

Soborovskiy, L. Z., Zinov'yev, Yu. M. SOV/79-29-7-10/83

TITLE:

Allyl Esters of Some Alkane-, Alkene-, and Chloroalkane  
Phosphinic Acids (Allilovyye estiry nekotorykh alkan-, alken- i  
khloralkanfosfinovykh kislot)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2152-2154 (USSR)

ABSTRACT:

Allyl alkane phosphinates are of importance as initial products for the synthesis of various polymer products. Up to now some alkane and alkene phosphinates have been obtained by causing allyl alcohol to react with acid chlorides of the corresponding phosphinic acids (Refs 1, 2) or, according to Arbuzov (Ref 3), from triallylphosphite and alkane halides. Allyl octane phosphinate was synthesized according to reference 4. Kamay and Kukhtin (Ref 5) described allyl chloroalkane phosphinates. In the present paper some allyl alkane, allyl alkene, and allyl chloroalkane phosphinates were synthesized. The acid dichlorides of the corresponding acids which had been obtained by oxidizing chlorophosphination of paraffin and olefin hydrocarbons (heptane, cyclohexane, propylene, butene-1) were used as initial substances. As far as some acid dichlorides obtained by this

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Allyl Esters of Some Alkane-, Alkene-, and  
Chloroalkane Phosphinic Acids

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method were mixtures of isomeric compounds, the resultant esters also consisted of isomers which differed by the position of the phosphorus-containing residue in the hydrocarbon radical (Refs 7, 8). Moreover, the acid chloride of propene phosphinic acid was obtained by dehydrochlorination of the acid chloride of chloropropane phosphinic acid. This acid chloride could be transformed into allyl propene phosphinate which probably contains an admixture of isomeric compounds. The constants of the compounds synthesized are tabulated. There are 1 table and 8 references, 6 of which are Soviet.

SUBMITTED: May 15, 1957

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